

UNION CARBIDE CORPORATION
NUCLEAR DIVISION

P. O. BOX 17, OAK RIDGE, TENNESSEE 37830

October 24, 1978

Department of Energy
Oak Ridge Operations
Attention: Mr. R. N. Collier, Jr.
Enriching Operations Division
Post Office Box E
Oak Ridge, Tennessee 37830

7051

Gentlemen:

Status of Nickel Toxicity Studies

The nickel toxicity studies being performed by Dr. H. P. Witschi of the ORNL Biology Division had achieved considerable progress but were not complete at the end of FY 1978. Preparations for the study had been completed and necessary materials had been obtained. In addition, experimental efforts had been made on a distribution study of nickel chloride by measuring its excretion in the urine and feces, and translocation in tissues, following a total intratracheal dose of approximately 10 milligrams. This study provided information necessary for establishing the optimum experimental protocol. The information obtained also was compared with other studies on the kinetics and distribution of materials in the lungs of rats.

The major experimental efforts which will extend these studies to nickel oxide, nickel subsulphide, and elemental nickel have been initiated. Dr. Witschi estimates that a final draft of the report on these studies will be available by mid-December.

No additional funds, beyond those supplied in FY 1978, have been or will be provided to ORNL to complete this study.

I hope this information will be sufficient to satisfy your reporting requirements.

Sincerely,

S. S. Stief

SSS:jc

cc: R. D. Gilmore
File - NoRC



UNION CARBIDE CORPORATION
NUCLEAR DIVISION

P. O. BOX Y, OAK RIDGE, TENNESSEE 37830

from Rick Collier
1-11-79

October 2, 1978

C. C. Lushbaugh, M.D., Chairman
Medical and Health Sciences Division
Oak Ridge Associated Universities
Post Office Box 117
Oak Ridge, Tennessee 37830

Dear Dr. Lushbaugh:

We appreciate your incorporating our suggested modifications in the letter of understanding concerning the "Welder Study." One signed original of the letter is enclosed.

Again, we are pleased that you are willing to undertake this study and we will work with you to assure its successful completion.

Yours very truly,

R. G. Jordan, Manager
Health, Safety, and
Environmental Protection

RGJ:cm

Enclosure

cc: R. F. Hibbs
File - RC

bc: L. F. Denton
R/ D. Cilmore
✓ S. S. Stief
R. A. Winkel

MEMORANDUM OF UNDERSTANDING

Between

UNION CARBIDE CORPORATION

And The

OAK RIDGE ASSOCIATED UNIVERSITIES, INC.

This MEMORANDUM OF UNDERSTANDING, entered into as of September 22, 1978, between the OAK RIDGE ASSOCIATED UNIVERSITIES (ORAU), acting under Contract No. EY-76-C-05-0033 with the United States of America (hereinafter called the "Government"), as represented by the United States Department of Energy (hereinafter called "DOE"), and UNION CARBIDE CORPORATION (hereinafter called "Union Carbide"), acting under its Contract No. W-7405-Eng-26 with the Government as represented by DOE, reflects the parties' understanding regarding ORAU/Union Carbide Cooperative Epidemiologic Study of Welder Population of those plants operated by Union Carbide for DOE at Oak Ridge, Tennessee.

Purpose: The purpose of the study will be to determine by epidemiologic methodology whether there are any deleterious health effects associated with welding (particularly with welding and/or cutting where the element nickel is involved) in the Oak Ridge DOE plants.

Scope: All present and past welders will be included who can be identified from Union Carbide records and other Oak Ridge employment records in the DOE Health and Mortality Study files located at Union Carbide's Computer Sciences Division (CSD).

Study Design: The vital status of all welders and suitable Union Carbide controls will be determined. A standard follow-up study of mortality and causes of death will be conducted using data on these groups and appropriate mortality data on the U. S. population. Subgroups of welders may be defined by using Union Carbide records, including industrial hygiene records and information on length of employment. Information on possible confounding variables, such as smoking habits and occupational histories, will also be needed in analysis and interpretation of the findings.

Goals: Collection of data will begin as soon as possible after this agreement is signed by the parties. This task will include identification of the welders and their controls, collection of any industrial hygiene data about exposures from all sources, and other data pertaining to smoking and off-site occupations. The collection of these data will be followed by a search, to be made through the Social Security Administration,

to identify those persons who have died. Death certificate copies will be obtained through the DOE Death Certificate Retrieval Office, ORAU. Many of the deceased may have been identified already, and copies of their certificates will be obtained through the DOE Health and Mortality Study at no charge to Union Carbide.

Personnel: This epidemiologic study will be carried out by the staff of the Medical and Health Sciences Division of ORAU under the epidemiologic research proposal (189) for FY-79 and FY-80, previously submitted to the Manager, Human Health Studies, Division of Biomedical and Environmental Research, DOE, April 1978.

C. C. Lushbaugh, M.D., Ph.D., is the designated person in charge for ORAU.

Anthony Polednak, Ph.D., is the assigned principal investigator, epidemiologist, who will conduct the study. He will be backed up and assisted by the staff of the Medical and Health Sciences Division. Costs of the ORAU epidemiologic group will be borne from funds provided to ORAU by DOE.

Robert Jordan, Manager, Health, Safety, and Environmental Protection, is the designated person in charge for Union Carbide.

Stanley Stief, Coordinator of Special Projects for the K-25 plant, is the designated coordinator for Union Carbide.

Robert Gilmore, Industrial Hygienist, is the designated day-to-day liaison contact for Dr. Polednak and is to expedite and assist in the study where Union Carbide facilities and staff are needed.

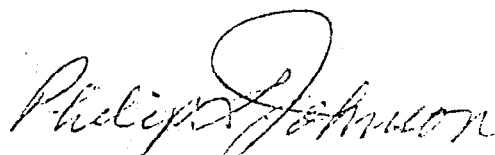
Dr. Polednak will use Dr. Edward Frome, who is ORAU's established interface with CSD, Union Carbide, to coordinate requests for aid from Lynn Denton and Howard Fore, CSD, Union Carbide. Dr. Frome will also provide assistance in statistical analyses.

Computer Costs: It is understood that Union Carbide will bear the costs of computer and programmer usage at CSD for data compilation for this study. ORAU will not charge any costs to Union Carbide for any computer usage and programming done at ORAU.

Principal Contracts: Union Carbide's undertaking pursuant to this Memorandum of Understanding shall be at the expense and risk of the Government, represented by DOE, under the terms of Contract No. W-7405-Eng-26. ORAU's participation hereunder is at the expense and risk of the Government, represented by DOE under the terms of Contract No. EY-76-C-05-0033.

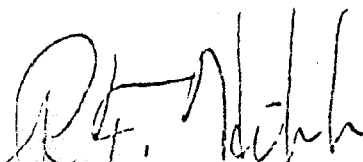
Reports: A preliminary report on mortality and causes of death will be completed as soon as possible. The final report barring unforeseen problems should be completed in one year. In order to satisfy these deadlines, the roster of names (welders and controls) and Social Security numbers must be completed in the first 3 or 4 months from initiation of the study. The collection of other data (industrial hygiene, smoking habits, etc.) will need to be collected simultaneously within 6 to 8 months.

Publication: It is understood that the scientific conduct of the study and the content of the scientific report, to be published in an epidemiologic journal, will be the responsibility of Dr. Polednak. The preliminary report will be reviewed by the Union Carbide coordinator to assure that the data and content are accurate. The results of this study will be made available to Union Carbide for any uses which are deemed appropriate pursuant to the terms of the applicable DOE contracts.



Philip L. Johnson
Executive Director
Oak Ridge Associated
Universities, Inc.

Date SEP 20 1978



R. F. Hibbs
President, Nuclear Division
Union Carbide Corporation

Date 9-22-78



UNION CARBIDE CORPORATION
NUCLEAR DIVISION

P. O. BOX Y, OAK RIDGE, TENNESSEE 37830

December 29, 1978

Department of Energy
Oak Ridge Operations
Attention: Mr. R. J. Hart, Manager
Post Office Box E
Oak Ridge, Tennessee 37830

Gentlemen:

Nickel Exposure Study

In your letter of December 28, 1976, you requested that UCC-ND undertake the lead role in over-all management of the nickel exposure study funded jointly by International Nickel (U.S.), Inc. (INCO), and ERDA, now DOE. That study has now been completed and copies of the final report and an executive summary are enclosed for your information and use.

On October 24, 1977, we forwarded to you our comments and information on inorganic nickel compounds in response to a notice published in the Federal Register, Volume 42, No. 187 - September 27, 1977, to assist in DOL-OSHA's efforts to establish an appropriate standard for occupational exposure to inorganic nickel and its compounds. In our comments we mentioned that the nickel exposure study was in progress, and stated that a copy of the study report would be forwarded to the Docket Officer, U. S. Department of Labor - OSHA, as soon as it was available. An additional copy of the study report is enclosed for your transmittal to the Docket Officer if you deem it appropriate.

We are continuing our efforts to obtain additional information which will help us to protect the health of our workers. An epidemiological study on welders exposed to nickel materials at the UCC-ND plants in Oak Ridge is under way at ORAU and is expected to be complete in 1979. You may wish to inform the Department of Labor that this study is in progress so that they are aware of, and can use, all available information in establishing appropriate standards for occupational exposure to inorganic nickel and its compounds.

Sincerely,

R. F. Hibbs, President

RFH:jc

Enclosures: Executive Summary (2)
Nickel Exposure Study Report (3)

cc: P. C. Fourney
C. J. Parks
H. Postma
P. R. Vanstrum
File - RFH (NoRC)

1.

WELDERS' STUDY

A cohort of about 1340 welders who worked at one or more of the Oak Ridge nuclear facilities has been identified by examination of job codes and job titles. The four facilities were: (1) Tennessee Eastman Corporation, which operated the Y-12 facility from 1943 to 1947; (2) the Y-12 plant under Union Carbide (1947 to the present); (3) the Gaseous Diffusion Plant, operated by Union Carbide from 1943 to the present; and (4) the Oak Ridge National Laboratory or X-10, operated by Union Carbide from 1948 to the present.

A preliminary mortality study is in progress, based on the results of a search for deaths made by the Social Security Administration early in 1974. Some 1,029 white male welders were employed before 1974. About 500 of these welders worked at the Gaseous Diffusion Plant, where nickel-alloy pipes are welded.

Observed numbers of deaths from specific causes or groups of causes were compared with expected numbers of deaths. Expected numbers were obtained by multiplying the person-years of observation (in five-year-age and calendar-year intervals from year of first employment as a welder to year of death or the end of 1973) by average annual death rates for U.S. white males specific for age and calendar year (five-year intervals). The differences between observed and expected numbers of deaths were tested for statistical significance by a summary chi-square test (Mantel and Haenszel, 1959). Ninety-five percent confidence intervals were calculated under the Poisson assumption (Haenszel et al., 1962) for selected cause-of-death categories.

Preliminary results indicate no statistically significant excess of deaths from all causes or from cancers of the respiratory system (or lung cancer). There were no deaths from nasal cancer.

Another search for deaths was made in 1979, and the results of that search will be included in the next analyses. Recently collected data on airborne nickel levels associated with welding will also be included, along with limited nickel bioassay data.

REFERENCES

Mantel, N. and W. Haenszel (1959) Statistical aspects of the analysis of data from retrospective studies of disease. J. Natl. Cancer Inst. 22: 719-748.

Haenszel, W., D. B. Loveland, and M. G. Sirken (1962) Lung cancer mortality as related to residence and smoking histories. Appendix C. J. Natl. Cancer Inst. 28: 1000-1001.